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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,582	04/14/2004	Gilles Arnaud	0595-1003	6229

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EXAMINER

HOLZEN, STEPHEN A

ART UNIT	PAPER NUMBER
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3644

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/823,582

Applicant(s)

ARNAUD, GILLES

Examiner

Stephen A. Holzen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) 2, 4 and 6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 7-11 and 13-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 2/26/2007 have been fully considered but they are not persuasive. Applicant has argued:
2. The applicant argued that the art does not suggest a clearance between 1.5% and 3.5% of the chord and therefore it would not be obvious to use a clearance between 1.5% and 3.5%. Further applicant has argued that one of ordinary skill would not design a clearance between 1.5% and 3.5% because nothing in the art motivates one of ordinary skill to make a clearance at these locations.

Applicant should remember that the courts have made clear that an obvious analysis need not seek out precise teachings from a prior art reference; instead the analysis can take account of the inferences and creative steps that a person of ordinary skill in the art would employ. (KSR v. Teleflex)

The examiner is therefore not persuaded by applicant's argument that the prior art must explicitly provide a suggestion, teaching or motivation because the courts have rejected this argument.

3. The applicant further argues that the claimed shape produced "unexpected results". The examiner is not persuaded by these arguments. The examiner asserts that any difference between the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant's arguments and declaration are substantially conclusionary in nature and do not

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provide specific evidence asserting that the act of changing the airfoil shape has a “greater than expected result.” Applicant’s arguments do not present evidence illustrating that claimed shape results in superior aerodynamic properties. Applicant alleged unexpected results with regard to the claimed shape of the airfoil, however there is no basis for judging the practical significance of data with regard to aerodynamic properties. (See *In re Nolan*, 553 F.2d 1261, 1267, 193 USPQ 641, 645 (CCPA 1977) and *In re Eli Lilly*, 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990) as discussed in MPEP § 716.02(c))

Since applicant has failed to provide evidence of “unexpected results” the examiner cannot agree that the instant shape is not obvious.

4. Claims 1-11, 13-21 are pending
5. Claims 2, 4 and 6 are withdrawn.
6. Claims 1, 3, 5, 7-11 and 13-21 have been examined.

Background of Airfoil Shape

7. An airfoil is the shape of a wing or blade as seen in cross-section. Airfoils are passed through air in order to provide either positive or negative lift. Subsonic-flight airfoils are characterized by a rounded leading edge, followed by a sharp trailing edge, and often with camber. The camber in aerospace engineering is the asymmetry between the top and the bottom curves of an airfoil. Cambered airfoils generate lift at positive, zero, or even small negative angle of attack, whereas a symmetric airfoil only has lift at positive angles of attack. The amount of lift generated by an airfoil depends on how much the flow is turned, which depends on the

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airfoil's shape. In general, the lift is a very complex function of the shape. Aerodynamicists model the shape effect by a lift coefficient, which is normally determined through wind tunnel testing.

The Glenn Research Center (www.grc.nasa.gov) illustrates the shape effects on lift on their website (please see: www.grc.nasa.gov/WWW/K-12/airplnae/shape.html). The airfoil on the left is a symmetric airfoil; the shapes above and below the white centerline are the same. The example shown explains why the aft portion of wings have hinged sections to control and maneuver an aircraft. Deflecting the aft section down produces geometry similar to the figure on the right producing more lift. Similarly, if the aft section is deflected up, it creates less lift (or even negative lift). The ability to vary the amount of lift over a portion of the wing gives the pilot the ability to maneuver an aircraft. The main point that one takes away from reading the Glenn Research Center website is that wings and flaps can be designed to having a plurality of different shapes, and that an engineer will design an wing/flap to suit the purpose for which the wing/flap needs to serve.

Claim Rejections - 35 USC § 103

8. Claims 1, 3, 5, 7-17, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phillips (6,970,773) in view of Munoz Saiz (6,109,567). Phillips discloses in FIG. 1G how to determine flap ratio for a wing 80 having a flap 82. The local chord length c is measured from the leading edge 84 to the trailing edge 86. The local flap chord length is measured from the front edge of the flap to the trailing edge 86. Figure 1F teaches that it is well known in the art to locate more than one flap on a single wing. Figure 1G further illustrates a symmetrical wing

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and a symmetrical flap. The wing has a leading edge that has an elliptical cross section and a clearance between the wing's trailing edge and the flap's leading edge. Neither the wing nor the flap has a concave shape. Phillips does not specifically disclose a rounded edged forwardly hinged flap and a clearance overhang. Saiz however teaches that it is well known in the art to hinge a symmetrical flap to the aft edge of the wing, to have an elliptical recess within the wing and to insert the elliptical leading edge of the flap into the recess (thus creating the clearance overhang). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the flap of Phillips as taught by Saiz for the purpose of degreasing overall wing/flap drag.

a. Neither Saiz nor Phillips discloses the specific/exact dimension claimed by the applicant. However as discussed above, aeronautical engineers have for years modified the shape of the airfoils to alter the lift & drag of airfoils and flaps.

b. It would have been obvious to one having ordinary skill in the art at the time the invention was made to design

- i. design the wing and/or flap to have a first major axis to minor axis quotient not less than 1.5
- ii. design the wing and/or flap to have a main angle (α) = 20 degrees
- iii. design the wing and/or flap to have a second major axis to minor axis quotient approximately equal to 1.5
- iv. design the wing and/or flap to have a second major axis to minor axis quotient equal to 2

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- v. situate the axis of rotation of the flap at a first distance from the first leading edge corresponding more or less to 25.5% of the Chord
- vi. to include the clearance between 1.5% and 3.% of the chord of the flap
- vii. to design the clearance such that it corresponds to approximately 2% of the flap chord
- viii. to design the clearing such that it is included between .4% and .8% of the total length separating a second leading edge from the first trailing edge
- ix. to design the clearance such that it corresponds to approximately 0.5% of the total length
- x. to design the partial overlap of the first leading edge and the second trailing edge such that it is located less than 10% of the cord of the flap.
- xi. to design each of the flap such that they are less than or equal to 15% of the second span distance and
- xii. to design the first span of each flap such that it is included between 7% and 10% of said second span of said lifting surface

since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boeson, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it

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may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). See also In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000)

In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (relating to the size of a structure were not sufficient to patentably distinguish over the prior art.); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) (mere scaling of the prior art would not establish patentability in a claim; 531 F.2d at 1053, 189 USPQ at 148.).

In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (The court held that the Configuration of the claimed device was a matter of choice, which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed device was significant.).

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One having ordinary skill in the art, in light of the above-cited case law, would conclude that that simply altering and claiming the dimensions of a known structure (wing and flap combination) for use in a substantially similar manner would be an obvious modification of this structure (wing flap combination).

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phillips (6,970,773) in view of Munoz Saiz (6,109,567) as applied to claim 1 above, and further in view of Miller et al (6,764,047). Neither Phillips nor Munoz Saiz disclose a filler between the flap and the wing. Miller et al however teaches that it is known to use flexible string hinges to couple between the flap and wing that effectively “seal off” (at least partially) the opening between the flap and the wing. It would have been obvious to one having ordinary skill in the art, at the time the invention was made to use the hinges of Miller et al in the flap and wing combination of Phillips for the purpose of decreasing overall aircraft weight.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903.

The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stephen A. Henry 7/30/07
Sah